

On determining ion mobility ...

S/185/61/006/005/019/019
D274/D303

fers from the motion of the radioactive atoms only in that it does not take part in the diffusive motion. This fact is often overlooked and the displacement of the radioactive atoms is reckoned from the cold ends of the specimens. The author shows that, in the general case, such experiments do not permit determining the direction, nor the magnitude of absolute ion mobility. Reference to cold ends can yield satisfactory results only if the concentration of the investigated component is small, and its mobility large in comparison with the mobility of the other components of the alloy. In conclusion, the displacement of the radioactive zone should be referred to a system of coordinates which does not take part in the diffusion and which is found in the same (homogeneous) temperature region of the specimen, as the radioactive zone. There is 1 figure and 15 references: 13 Soviet-bloc and 2 non-Soviet-bloc. ✓

ASSOCIATION: Kyyivs'kyi derzhavnyi universytet im. T.H. Shevchenka
(Kyyiv State University im. T.H. Shevchenko)

SUBMITTED: May 4, 1961

Card 3/3

5/161/62/004/002/031/051
5101/3102

Kashchenko, G. P., Ostrovskiy, L. P., and Koval'chuk, V. S.

Activity of ^{124}Sb , ^{60}Co , and ^{59}Fe in solid copper

PERIODICAL: Fizika tverdogo tela, v. 4, no. 2, 1962, 400 - 405

TEXT: A 0.5 - 1.0 μ thick film of ^{124}Sb , ^{60}Co , or ^{59}Fe was electrodeposited onto the end faces of cylindrical copper specimens of 3 - 5 mm diameter and 15 - 20 mm length. The specimens were connected to the electrodes of a vacuum device and subjected to current densities of 150 - 250 A/cm^2 at elevated temperatures. Subsequently, layers were mechanically removed parallel to the contact areas, and the activity was measured in a 6-2 device with a gamma counter. The integral activity N was plotted versus the depth x of the layer under examination, wherefrom the velocity of ion motion and the diffusion coefficient D were calculated. The absorption of radiation by the substance was taken into account when calculating v and D for Sb in Cu : $i(x) = \mu N + \partial N / \partial x$, where $i(x)$ is the true specific activity at the depth x , and μ is the experimentally determined linear absorption coefficient. $\partial N / \partial x$ was found by graphical

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differentiation. The relation $D_{Sb} = 1/4t \tan \psi$ was derived from $\ln = f(x^2)$. ψ denotes the slope of the straight line. v and D were used to calculate $F/eE = vkT\alpha/Deiq$, where F is the force determining the ion mobility in the lattice; eE is the effect of the electric field E on a singly charged ion; i is the current density; q is the resistivity; $\alpha = 0.78$. The scattering cross section σ^* for the activated ion was calculated from $-F/eE = q - \bar{q}\sigma^*/\bar{\sigma}$, where q is the charge of the diffusion ion, \bar{q} is the average charge of a lattice ion; $\bar{\sigma} = e^2 \bar{q} \bar{q} / (2m\epsilon)^2$, where $\bar{\sigma}$ is the average scattering cross section, m is the electron mass, and ϵ is the Fermi energy (for Cu $\epsilon = 7$ eV). In addition, the effective charge q^* of the activated ion was calculated from $\sigma^* = (\pi q^{*2} e^4 / 2 \epsilon^2 [\ln(1+1/y) - 1/(1+y)])$. Results: (1) All the three metals move toward the anode; (2) the ions in the lattice migrate due to an electron wind which is 30 times stronger than the field effect on a singly charged ion; (3) $\sigma_{Co}^* = 4.8 \cdot 10^{-16} \text{ cm}^2$ (average value for 1155 - 1218°K); $q_{Co}^* = 1.20$ electrostatic units; $\sigma_{Fe}^* = 6.7 \cdot 10^{-16} \text{ cm}^2$ (1307 - 1323°K); $q_{Fe}^* = 1.4$; $\sigma_{Sb}^* = 5.6 \cdot 10^{-16} \text{ cm}^2$ (1093 - 1143°K); $q_{Sb}^* = 1.35$. According to previous papers (Ukr. fiz. Card 2/3

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zhurn. 5, 720, 1960; *ibid.*, 6, 116, 1961), q has the following values for non-activated ions: $q_{Co} = 2.8$; $q_{Fe} = 3.12$; $q_{Sb} = 2.6$. The smaller charge of the activated ions is possibly due to varying electron structures. There are 2 figures, 1 table, and 14 references: 13 Soviet and 1 non-Soviet. The reference to the English-language publication reads as follows: K. Compaan, Y. Haven, *Trans. Faraday Soc.*, 52, 786, 1956.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet im. T. G. Shevchenko
(Kiyev State University imeni T. G. Shevchenko) ✓

SUBMITTED: September 25, 1961

Card 3/3

54700

S/181/62/004/005/042/055
B139/B102

AUTHORS: Kuz'menko, P. P., and Ostrovskiy, L. F.

TITLE: Mobility of silver in nickel

PERIODICAL: Fizika tverdogo tela, v. 4, no. 5, 1962, 1358-1360

TEXT: The polished front faces of round nickel rods, 5 mm in diameter and 15 - 20 mm in length, were coated with a layer of radioactive silver 0.5 - 1.0 μ thick. The specimens were electrically connected in vacuo, the areas of contact being preheated to 900°C and then brought up to the temperature required for the experiment. Current density was 40 - 120 a/mm². Subsequently, the depth distribution of integral activity $I(a)$ was measured in the anode and cathode parts of the layers removed by mechanical means. Owing to a notable evaporation of silver, this amounted to only 300 - 700 imp./min, with a background of 40 imp./min. As an example experiment no. 5 gave the following results: $t = 3$ hrs, $T = 1643^\circ\text{K}$, current density $i = 74$ a/mm², ion velocity $v = 16.3 \times 10^{-7}$ cm/sec, diffusion coefficient $D = 15.6 \times 10^{-9}$ cm²/sec, electric resistance of nickel

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✓B

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at the experimental temperature $\rho = 60.7 \times 10^{-6}$ ohm.cm, $\frac{F}{eE} = 26$. These results cannot be explained by field action on the positive charge of the silver ion, but rather on the assumption that the electronic holes play the same part as the electrons in simple metals. In the case of transition metals through which d-c flows, the force of the hole wind is decisive for migration. In interpreting experimental results, this fact must be taken into account when migration proceeds toward the cathode. There are 1 table and 1 figure. ✓B

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet im. T. G. Shevchenko
(Kiev State University imeni T. G. Shevchenko)

SUBMITTED: December 30, 1961

Card 2/2

40883

S/181/62/004/009/016/045
B108/B186

AUTHOR: Kuz'menko, P. P.

TITLE: Scattering cross section and effective ion charge in metals

PERIODICAL: Fizika tverdogo tela, v. 4, no. 9, 1962, 2434 - 2440

TEXT: The scattering cross sections and the effective charges of impurity ions in Cu, Ag, Au, Al and Pb were studied. The residual resistivity of metals is changed by impurities which disturb the crystal lattice through a geometrical factor. The scattering cross section can be calculated from this residual resistivity ($\Delta\rho_0$ for 1 at% impurity) by using the following formula given by Mott (The Theory of the Properties of Metals and Alloys, Oxford, 1936): $\sigma = \Delta\rho_0 e^2 n \cdot 100 / (2m\xi)^{1/2}$, where n is the number of conduction electrons per metal atom and ξ is the Fermi energy. The effective charge can be determined from the scattering cross section by using the formula $\sigma = \frac{\pi}{2} \frac{q^2 e^4}{\xi^2} [\ln(1+1/y) - 1/(1+y)]$. $q = q_1 - q_0$ is the difference

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in the effective charges of dissolved substance (impurity) and solvent (metal); $1/y = 5.14 \cdot 10^{-8} (n_0)^{1/3}$; n_0 is the number of conduction electrons per unit volume of the metal. By considering the effective charge to be the charge of an impurity atom for one conduction electron it is possible to estimate the effective charge, using the idea that the conduction electrons are screened from the positive charge by the valence electrons. It is established that only one valence electron of multivalent impurities contributes to conduction. The rest of the electrons are in a bound state. In the case of high impurity concentration (solid solution), Δq depends parabolically on the concentrations. By considering this aspect one obtains $\sigma = ne^2 M k \theta^2 q / 2 (2m\xi)^{3/2} T$ (11) for σ of the defects, where θ is the characteristic temperature. q , q_1 and σ were calculated numerically for Cu, Ag, Au, Al and Pb. Δq_0 -values for Al were taken from F. Pawlek and K. Reichel (Metal, 12, 1, 1958), while for Pb own measurement data were used. There are 5 tables. The most important English-language reference is: R. O. Simmons, R. W. Baffuli, Phys. Rev., 117, 62, 1960.

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Scattering cross section and...

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ASSOCIATION: Kiyevskiy gosudarstvennyy universitet im. T. G. Shevchenko
(Kiev State University imeni T. G. Shevchenko)

SUBMITTED: April 16, 1962

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hh124

S/181/62/004/010/003/063
B108/B186

AUTHORS: Kuz'menko, P. P., Novikov, N. N., and Gorid'ko, N. Ya.

TITLE: The photomechanical effect in antimony

PERIODICAL: Fizika tverdogo tela, v. 4, no. 10, 1962, 2656-2659

TEXT: Earlier studies (G. C. Kuczynski, R. H. Hochman. J. Appl. Phys., 30, 267, 1959) revealed a photomechanical effect (reduction in microhardness) in germanium in the range of intrinsic absorption ($2 - 4\mu$). Attempts were made to find out whether this effect occurs in other materials with similar intrinsic absorption bands, e. g. in Sb or Bi. To study this effect in antimony, small specimens of high purity (99.999%) were hardness-tested at an approximately constant temperature of $15-16^{\circ}\text{C}$ using a PMT-3 (PMT-3) device with a diamond pyramid. The microhardness was found to decrease linearly with the intensity of light in the visible and near infrared region used for illuminating the sample. This decrease, however, continues only to about 30,000 lux, and the microhardness which up to there has dropped by 45% remains constant at higher illuminances. Tests with filtered light showed that the

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photomechanical effect is due only to infrared radiation, which proves some semiconducting property of antimony. The infrared light transfers electrons to higher energy levels thus changing the dislocation mobility and, consequently, also the mechanical properties of antimony. Careful examination of Cu revealed no photomechanical effect. There are 4 figures. ✓

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet im. T. G. Shevchenko (Kiev State University imeni T. G. Shevchenko)

SUBMITTED: April 23, 1962 (initially)
June 12, 1962 (after revision)

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B1061

S/181/62/004/010/059/063

B102/B104

AUTHORS: Kuz'menko, P. P., and Ostrovskiy, L. F.

TITLE: The Ag¹¹⁰ mobility in magnesium

PERIODICAL: Fizika tverdogo tela, v. 4, no. 10, 1962, 2984-2986

TEXT: The Ag¹¹⁰ mobility in Mg of the variety MG-1 (MG-1) was determined by a d-c method described in the authors' earlier papers (UFZh, 6, 525, 1961; FTT, 4, 490, 1962; 4, 1360, 1962). The measurements were made in the range 470-570°C at current densities of 38 - 63 a/mm². The curves showing the depth-dependence of the integral activity enabled the migration rate v was calculated. Then, by comparing the forces acting on the ion ($F/Ee = vakT/Deiq$) in accordance with the usual procedure, the effective charge of the silver ion and the mean scattering cross section are calculated, using Fiks' theory (V. B. Fiks, FTT, 1, 16, 1959):

- $F/eE = q^* - \bar{q} \sigma/\bar{\sigma}$, where q^* is the charge of the activated ion, \bar{q} is the mean ion charge in the metal, σ the scattering cross section of the

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The Ag¹¹⁰ mobility in magnesium

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activated Ag ion and $\bar{\sigma}$ the mean scattering cross section. The results were: $\bar{\sigma} = 6.7 \cdot 10^{-16} \text{ cm}^2$ which is almost equal to the cross section $r^2 \pi$, and $\bar{q}_{\text{Ag}} = 1.5$. The great value of \bar{q} shows that the Ag electron structure in Mg differs greatly from that of activated Ag in Ag. There are 1 figure and 1 table.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet im. T. G. Shevchenko (Kiyev State University imeni T. G. Shevchenko)

SUBMITTED: June 14, 1962

Card 2/2

L3129
S/181/62/004/011/030/049
B125/B186

24.7500

AUTHORS: Kuz'menko, P. P., and Grinevich, G. P.

TITLE: Diffusion and mobility of Sb¹²⁴ in nickel

PERIODICAL: Fizika tverdogo tela, v. 4, no. 11, 1962, 3266-3269

TEXT: It is shown that the temperature dependence of the diffusion coefficient satisfies the following relation: $D_{Sb} = 1.8 \cdot 10^{-5} \exp[-27000/RT]$.
When d-c passes through the specimens a migration of Sb to the cathode was observed in all the experiments. It is concluded from a thorough analysis of the $D_{Sb}(T)$ curve that the migration is due to a hole wind, resulting from scattering of holes from Sb ions. Specimens were prepared from a 99.97% Ni base on which a radioactive Sb film, 1-2 μ thick, was electrolytically deposited. Specimens were preliminarily annealed for 30-40 min at 600°C to initiate diffusion and ensure resorption of Sb. Test temperatures ranged between 1020 and 1220°C. The activation energy of self-diffusion of Ni was found to exceed that of the antimony diffusion by a factor of 2.5. In order to study the mobility of Sb¹²⁴ in Ni, radioactive
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Sb was deposited in the same way on the carefully ground faces of two Ni cylinders of 3-5 mm diameter and 15-20 mm long. After contact had been established between the activated surfaces of the two cylinders they were connected to the electrodes of an evacuated apparatus. The current density inside the sample reached 100 a/mm^2 . The contact area was heated first to $580-600^\circ\text{C}$ and then held at these temperatures for 25-30 min. Then the temperature was raised to test levels and the holding time was varied between 7 and 22 hrs. Afterwards the test specimens were separated at the contact surface and the γ -activity distribution along the sample axis was measured on both sides. From the curves showing the dependence of the integral activity on the depth of penetration the expression $F/eE - V_k T \alpha / D e i Q$ was calculated; the mobility of the Sb ion can be calculated from the force F , eE is the force acting on a single ion, i is the current density, Q is the specific electric resistance, $\alpha = 0.78$. According to the experimental data, F/eE tends to increase with decreasing T , which contradicts the theory. Consequently it is not possible to explain the direction of the Sb migration by the direction of the field strength. Therefore, it may be assumed that Sb is transported by the force of the hole wind. Similar results were obtained by one of the authors

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(FTT, 4, 5, 1358, 1962) for the migration of Ag in Ni. There are 3 figures and 2 tables.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet im. T. G. Shevchenko
(Kiyev State University imeni T. G. Shevchenko)

SUBMITTED: June 28, 1962

Table 2. Mobility of antimony in the direction of motion.

Legend: (1) number of experiment; (2) t, hours; (3) cm^2/sec ; (4) v , μ/hr ;
(5) $\rho \cdot 10^5$, $\text{ohm} \cdot \text{cm}$; (6) direction of transfer.

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0185
S/185/62/007/002/001/016
D299/D302

24.7700 (1043, 1055, 1144)

AUTHOR: Kuz'menko, P.P.

TITLE: Mobility mechanism and effective ionic charges in metals (Survey)

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 7, no. 2, 1962,
117 - 130

TEXT: Experimental methods are reviewed, used in the study of ionic mobility in metals. The nature of ionic mobility is discussed. The following experimental methods are considered: Diffusion in the presence of an electric field, the method of radioactive tracers, the method of weighing, and the combined method (radioactive tracers plus weighing). With regard to the diffusion method, the diffusion coefficient in the direction of the field equals that in the opposite direction and also the diffusion coefficient in the absence of the field; the experimental results are in agreement with the theory. The tracer method has the advantage that it yields not only the transport rate v , but also the diffusion coefficient D ; this is

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important for quantitative studies of the magnitude of the resultant force, responsible for the transport. The tracer method was successfully used with Ag, Al, Cu, Au, Sb, Cd, Zn, Pb, and the alloys Al-Zn, Al-Ag, Fe-Al, Ag-Mg, and Mg-Cd; it could not be used with Fe, Ni, Ti. The combined method was used for studying the mobility of Fe and Al in Fe-Al alloys. The nature of ionic mobility: For all the metals, the transport took place towards the anode. This shows that the mechanism of ionic mobility in metals differs substantially from that in electrolytes. The transport of ions to the anode, in the presence of a d.c.-field in the metal, can be explained by the fact that the activated ion is not only subjected to the field forces, but also to the stronger force of the electronic wind. The latter arises as a result of the scattering of valence electrons. Further, the transport rate v was studied in relation to various factors. The experimental results concerning ionic mobility, were in agreement with Fick's theory. The following problems still remain open: Whether the transport in the investigated metals is due to the force of the electronic wind only, or to the sum of the field and electronic wind forces; the role of the hole wind.

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Using Fick's equation and experimental values of E/eE , it is possible to determine the scattering cross-section σ^* of activated ions; σ^* was found to be temperature independent. For determining the effective charge q^* of the activated ion, the author uses a formula analogous to Mott's formula for the scattering cross-section. The use of Mott's cross-section for activated ions is substantiated by the agreement between the experimental and calculated values of σ^* . The obtained charges are in fact the effective charges of activated ions, on which conduction-electrons are scattered. There are 10 figures, 2 tables and 27 references: 20 Soviet-bloc and 7 non-Soviet-bloc, (including 2 translations). The references to the English-language publications read as follows: E. Compaan, L. Harren, Trans. Far. Soc., 52, 786, 1956; N. Mott, H. Jones, Theory of the Properties of Met. and Alloys, Oxford, 1936. X

ASSOCIATION: Kyivskyy derzhuniversytet im. T.H. Shevchenka (Kyiv State University im. T.H. Shevchenko)

SUBMITTED: June 14, 1961

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S/185/62/007/011/014/019
D234/D308

AUTHORS: Kuz'menko, P.P. and Suprunenko, P.O.

TITLE: Some anomalous properties of α -Ti

PERIODICAL: Ukrayins'kyi fizychnyy zhurnal, v. 7, no. 11, 1962,
1242-1245

TEXT: Metals in which the last Brillouin zone is almost completely filled exhibit as a rule absorption bands in the red and infrared regions. The band width is assumed to correspond to an energy ΔE . If such metals are heated, a part of the electrons will probably pass into the almost empty higher energy where their mobility will be greater. This will cause an increase in the conductivity and the temperature dependence of the resistance will therefore differ from that of other metals. In the case of α -Ti $\sigma = \sigma_1 + \sigma_2$, σ_1 being the conductivity when the passage of electrons can be neglected. The resistance $\sigma_1 = 1/\rho_1$ can be found by extrapolation to high temperatures. Assuming that the conductivity can be described as for a semiconductor, except that the mobility of an

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electron is proportional to $1/T$ and the Fermi energy is practically independent of temperature, $\ln(\Delta\rho/\rho) - (3/2) \ln T$ must depend linearly on $1/T$. This is confirmed graphically, and the value of ΔE was found to be 2.8 kcal/mole. The deviation of the heat capacity from 5.95, found by a similar method, is 2.4 kcal/mole, which agrees well with experimental data. According to the above, an infrared absorption band near 11 microns is to be expected. There are 4 figures. ✓

ASSOCIATION: Kyiv'skyy derzhuniversytet im. T.H. Shevchenka
(Kiev State University im. T.H. Shevchenko)

SUBMITTED: April 20, 1962

Card 2/2

S/185/62/007/012/012/021
D234/E308

AUTHORS: Kuz'menko, P.P. and Kal'na, H.I.

TITLE: X ray structural investigations of
ordered Mg-Cd systems.

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 7,
no. 12, 1962, 1335 - 1338

TEXT: Polycrystalline specimens with the Cd
content ranging from 10 to 80 at.% as well as specimens of
pure Cd and Mg were investigated. At 300°C there is a single-
phase solid solution and all alloys possess a close-packed
hexagonal structure. There is no smooth variation of lattice
parameters with concentration. With decreasing temperature all
alloys showed an order-disorder transition, with an ordered
structure on the basis of MgCd, or MgCd, depending on Cd con-
tent. At 200°C alloys with 75.3% Cd or more have an unordered
phase with parameters near to those of pure Cd and an ordered
one. Anomalies are observed in the temperature dependence of

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lattice parameters and heat capacity. At 20 - 300°C, a and c are proportional. At 300 - 355°C a varies much more than c, and at 355 - 405°C c increases anomalously while a remains practically constant. There are 4 figures. ✓

ASSOCIATION: Kyivskyy derzhuniversytet im. T.H. Shevchenka (Kiev State University, im. T.H. Shevchenko)

SUBMITTED: May 21, 1962

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S/185/62/007/012/013/021
D234/D308

AUTHORS: Kuz'menko, P.P. and Kal'na, H.I.

TITLE: Long-distance order parameters and distribution of atoms over the lattice points in Mg-Cd alloys

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 7, no. 12, 1962, 1340 - 1344

TEXT: The authors calculated the long-range order parameter for Cd content ranging from 10 to 75.3 at.%, using the formula $(J_s/J_f) k^2 F_f^2 / (f_1 - f_2)^2 \epsilon^2$, where f_1 and f_2 are atomic factors of the components, J_s and J_f are intensities of a superstructural and a fundamental line and F_f is the structural amplitude of the fundamental line. On comparing the calculated results with experimentally determined parameters, disagreement was observed in the cases of 10, 16.6 and 66.7 % Cd. The calculated values indicate that the order-disorder transition is of the type of a phase transition of the first

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kind. The distribution of atoms over the lattice points, determined from the structural factors of two fundamental lines (202), (220) and two superstructural lines (112), (102), are plotted against Cd concentration. There are 4 figures and 1 table. ✓

ASSOCIATION: Kyivskyy derzhuniversytet im. T.H. Shevchenka (Kiev State University, im. T.H. Shevchenko)

SUBMITTED: June 7, 1962

Card 2/2

S/185/62/007/012/015/021
D234/D308

AUTHORS: Kuz'menko, P.P. and Koval'chuk, V.S.
TITLE: The electric transfer of Sb in Al
PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 7,
no. 12, 1962, 1350 - 1354

TEXT: The authors studied the transfer of Sb¹²⁴ in cylindrical specimens of 99.9 % pure Al in the presence of constant current (thin layers of Sb were formed electrolytically on both ends of a specimen for this purpose). Sb was transferred towards the anode in all cases. The results are tabulated together with the transfer velocity, boundary diffusion coefficient and effective charge determined for each case. The effective charge was much smaller than the valency of Sb, which leads to the conclusion that Sb atoms move along the grain boundaries in neutral state. There are 3 figures and 1 table.

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The electric transfer of Sb in Al S/185/62/007/012/015/021
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ASSOCIATION:

Kyyivs'kyi derzhuniversytet im. T.H.
Shevchenka (Kiev State University im.
T.H. Shevchenko)

SUBMITTED:

May 4, 1962

✓

Card 2/2

S/148/62/000/011/007/013
E111/E435

AUTHORS: Kuz'menko, P.P., Ostrovskiy, L.F.

TITLE: Electro-transfer of silver in copper

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Chernaya metallurgiya, no.11, 1962, 146-149

TEXT: The transfer of silver in solid copper under the influence of heavy direct currents was studied with the aid of the radioactive isotope Ag^{110} . With intensive cooling of the electrode current densities of 200 to 300 A/mm² could be obtained. After current had passed for several hours the distribution of radioactivity along the specimen on one end of which a layer of Ag^{110} had previously been deposited was studied. Substantial transfer of silver towards the anode occurred indicating that, as in other systems studied by the authors, the motive force was the force of the electron wind. From the results obtained the average value of the effective charge of the activated (i.e. participating in the diffusion) silver ion in copper was found to be 0.73 electron units. There are 1 figure and 1 table.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet (Kiyev State University)

SUBMITTED: February 21, 1961
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S/126/62/013/003/011/023
E021/E180

AUTHORS: Kuz'menko, P.P., Ostrovskiy, L.F., and
Koval'chuk, V.S.

TITLE: Mobility of small tin additions in copper and silver

PERIODICAL: Fizika metallov i metallovedeniye, v.13, no.3, 1962,
406-410

TEXT: The absolute transfer of tin in copper and silver during the passage of a direct current was studied by a method described previously (Ref.2: P.P. Kuz'menko, L.F. Ostrovskiy, Ukr.fiz.zhurnal, no.6, 1961, 525). A thin layer of radioactive tin was deposited electrolytically on one end of two similar samples (2.5-3.5 mm diameter and 15-20 mm length). The active surfaces were placed in contact and connected to the electrodes in a vacuum apparatus. Current densities varied from 140 to 400 A/mm². The contact region was heated by direct current to 220 °C and held for 15-20 minutes. Then the current was increased and the contact region heated to the test temperature. After the test, the sample was removed from the apparatus and

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broken along the contact plane, and the distribution of activity in the cathode and anode halves was measured. In all the experiments the tin migrated to the anode. Therefore, the force causing the migration is due to electrons, and arises from the scattering of valency electrons of the activated tin ions, because of the destruction of the periodicity of the lattice potential by the tin ions. The effective charge of the activated tin ion in electron units was calculated from the results obtained at different temperatures. For tin in pure copper, the effective charges at 1075, 1109, 1174 and 1153 °C are 1.6, 1.8, 1.3 and 1.0. For tin in copper + 0.1 atomic % tin the charges at 1101, 1161, 1159 °C are 1.5, 1.3 and 1.1. For tin in silver + one atomic % tin the charges at 1205, 1115, 1076, 1181, 1073 and 997 °C are 1.1, 1.2, 1.3, 0.9, 1.3 and 1.5 respectively. There are 4 figures and 2 tables.

ASSOCIATION: Kiyevskiy gosuniversitet im. T.G. Shevchenko
Card 2/2 (Kiev State University imeni T.G. Shevchenko)

SUBMITTED: June 21, 1961

KUZ'MENKO, P.P.; NOVIKOV, N.N. [Novykov, M.M.]; GORID'KO, N.Ya.
[Horyd'ko, M.IA.]

Photomechanical effect in titanium. Ukr. fiz. zhur. 8 no.1:
116-120 Ja '63. (MIRA 16:5)

1. Kiyevskiy gosudarstvennyy universitet im. Shevchenko.
(Titanium) (Metals, Effect of radiation on)

S/185/63/008/001/021/024
D234/D308

AUTHORS: Kuz'menko, P. P. and Kal'na, H. I.

TITLE: Heat effects and kinetics of ordering in Mg-Cd alloys

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 8, no. 1, 1963,
138-139

TEXT: Using the results of their previous papers the authors have obtained the formula

$$\frac{\Delta R}{\Delta R_0} c = (1 - e^{-(at)^b}) \quad (2)$$

ΔR being the variation of electric resistance at a given stage,
 ΔR_0 its variation during the whole transformation; c is the ratio
of the resistance of the ordered phase to R . Double logarithm of
 $\Delta R_0 / (\Delta R_0 - c R)$ was plotted against the logarithm of time for all

Card 1/2

Heat effects and ...

S/185/63/008/001/021/024
D234/D308

alloys investigated earlier. The experimental plots lie on straight lines, and two stages with different values of b can be seen for each temperature. A graph of the activation energy against Cd concentration is given. There are 3 figures.

ASSOCIATION: Kyivskyy derzhuniversytet im. T. H. Shevchenka
(Kiev State University im. T. H. Shevchenko)

SUBMITTED: June 7, 1962

Card 2/2

KUZ'MENKO, P.P.; NOVIKOV, N.N. [Novykov, M.M.]; GORID'KO, N.Ya.
[Horid'ko, M.IA.]

The anomalous properties of antimony. Ukr. fiz. zhur. 8
no.7:787-792 J1 '63. (MIRA 16:8)

1. Kiyevskiy gosudarstvennyy universitet im. Shevchenko.
(Antimony—Thermal properties)
(Antimony—Electric properties)

KUZ'MENKO, P.P.; KHAR'KOV, Ye.I. [Khar'kov, I.E.I.]; LOZOVYI, V.I. [Lozovyi, V.I.]

Electrotransmission of silver in liquid lead and cobalt in
liquid tin. Ukr. fiz. zhur. 9 no.8:881-889 Ag '64.

(MIRA 17:11)

1. Kiyevskiy gosudarstvennyy universitet im. Shevchenko.

SOURCE: Fizika tverdogo tela, v. 6, no. 9, 1964, 2580-2582

TOPIC TAGS: solid state physics, piezoelectric effect, temperature range, band structure, piezoelectricity, piezoelectric materials, piezoelectricity

ABSTRACT: An attempt is made to determine the conditions under which the piezoelectric effect is observed in the case of a piezoelectric material.

L 404924

ACCESSION NR: AP4044924

0

induced rise in dislocation density, the mechanism of the process remaining still
unexplained. In their last experiments, changes in the hardness of n-type
germanium and of antimony selenide were measured as a function of the annealing

temperature. It was found that the hardness of n-type germanium increases with
annealing temperature up to about 400°C, after which it decreases. The
hardness of antimony selenide increases with annealing temperature up to about
300°C, after which it decreases. The increase in hardness with annealing
temperature is attributed to the formation of dislocations. The decrease in
hardness with annealing temperature is attributed to the annihilation of
dislocations. The results of these experiments are in good agreement with the
results of other experiments on the annealing of dislocations in semiconductors.
The authors conclude that the mechanism of the process is still unknown, but
that the results of these experiments are in good agreement with the results of
other experiments on the annealing of dislocations in semiconductors.

L 9049-65

ACCESSION NR: AP4044924

which occurs at 100-1100 in the case of germanium, that is, when a temperature dependence of the calculated sample begins to rise before a merging of the two curves. Orig. art. has: 3 figures.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet imeni T. G. Shevchenko
(Kiev State University)

L 16116-65 EWP(e)/WT(m)/EWP(t)/EWP(z)/EWP(b) Pf-4/Idi ASD/rs)A WL/
ASL(a)-5/ASD(p)-5/ASDCK/IDP(e) CD/BA

ACCESSION NR: AP4044170

S/0185/64/009/008/0881/0889

AUTHOR: Kuz'menko, P. P., Khar'kov, Ye. Y. (Khar'kov, Ye. I.); Lozov'y, V. I. (Lozovoy, V. I.)

TITLE: Transfer of silver in liquid lead, and of cobalt in liquid tin by electric current

SOURCE: Ukrains'ky v fizychny v zhurnal v. 9, no. 8, 1964, 881-889

TOPIC TAGS: electrotransfer, silver, cobalt, electrolysis, liquid metals

ABSTRACT: The authors suggest a possible mechanism of the ions mobility in liquid metals. A new procedure for experimental determination of the mobility of silver cations in liquid lead is described. It is shown that the mobility of silver cations in liquid lead is higher than the mobility of cobalt cations in liquid tin. The results of the experiments are compared with the theoretical calculations. The paper contains 4 figures, 2 tables.

Card 1/2

L 16116-65

ACCESSION NR: AP4044170

ASSOCIATION: Ky*yivs'ky*y derzhuniversy*tet im. T. G. Shevchenka (Kiev State University)

SUBMITTED: 29Nov63

ENCL: 00

SUB CODE: IC, EM

NO REF SOV: 014

OTHER: 006

Card 2/2

OSTROVSKIY, L.F.; KUZ'MENKO, P.P.

Mobility of silver in bismuth and of antimony in tin. Fiz. met. i metalloved. 17 no.1:78-82 Ja '64. (MIRA 17:2)

1. Kiyevskiy ordena Lenina gosudarstvennyy universitet im. Shevchenko.

KUZ'MENKO, P.P.; NOVIKOV, N.N.; GORIL'EO, N.Ya.

Temperature range of the existence of the photomechanical
effect. Fiz. tver. tela 6 no.9:2580-2582 S '64.

(MIRA 17:11)

1.Kiyevskiy gosudarstvennyy universitet imeni Shevchenko.

KUZ'MENKO, P.P.; KHAR'KOV, Ye.I. [Khar'kov, Ye.I.]; LOZOVYI, V.I. [Lozovyi, V.I.]

Electroconvective diffusion in liquid tin and lead. Ukr. fiz. zhur. 10 no.8:912-913 Ag '65. (MIRA 18:8)

1. Kiyevskiy gosudarstvennyy universitet im. Shevchenko.

GOLOTYUK, F.P. [Holotiuk, F.P.]; KUZ'MENKO, P.P.; KHAR'KOV, Ye.I.
[Khar'kov, IE.I.]

Determining the coefficients of diffusion and electric resistance
of impurities in liquid metals. Ukr. fiz. zhur. 10, no. 11:1227-
1236 N '65. (MIRA 18:12)

1. Kiyevskiy gosudarstvennyy universitet imeni Shevchenko.
Submitted January 20, 1965.

KUZ'MENKO, P.P.; NOVIKOV, N.N. [Novykov, M.M.]; GORID'KO, N.Ya.
[Horid'ko, M.IA.]; SALEY, V.S.

Use of the infrared polariscopy method in studying photo-
mechanical and electromechanical effects. Ukr. fiz. zhur. 10
no. 11:1258-1259 N '65. (MIRA 18:12)

1. Kiyevskiy gosudarstvennyy universitet imeni Shevchenko.
Submitted February 15, 1965.

L 15158-66 EWT(1)/EWP(a)/EWT(m)/EWP(b) - WE

ACC NR: AP6002029

SOURCE CODE: UR/0185/65/010/012/1359/1364

AUTHORS: Holotyuk, F. P. -- Golotyuk, F. P.; Kuz'menko, P. P.; Khar'kov, Ye. Y. --
Khar'kov, Ye. I.

ORG: Kiev State University im. T. G. Shevchenko (Kyyivs'kyi derzhuniver-
sytet)

TITLE: A method of studying the mobility of atoms in liquid metals

SOURCE: Ukrayins'kyi fizychnyy zhurnal, v. 10, no. 12, 1965, 1359-1364

TOPIC TAGS: liquid metal, metal diffusion, electric resistance, atom,
particle motion

ABSTRACT: The method described is based on measuring the electrical resistance of the anode and cathode portion of a sample. The electrical resistance changes as a result of the change in the distribution of the impurity atoms in the sample. The equations for the rate of electric transport of the impurity, the characteristic time, and the diffusion coefficients obtained from a theoretical discussion of the method are applicable as long as one can neglect the flux of impurity atoms due to the concentration gradient. To measure the mobility of ^ASb atoms in a liquid alloy of Sn¹⁴ at. % Sb, quartz capillaries were filled with the liquid and were joined by a capillary which was heated.

Card 1/2

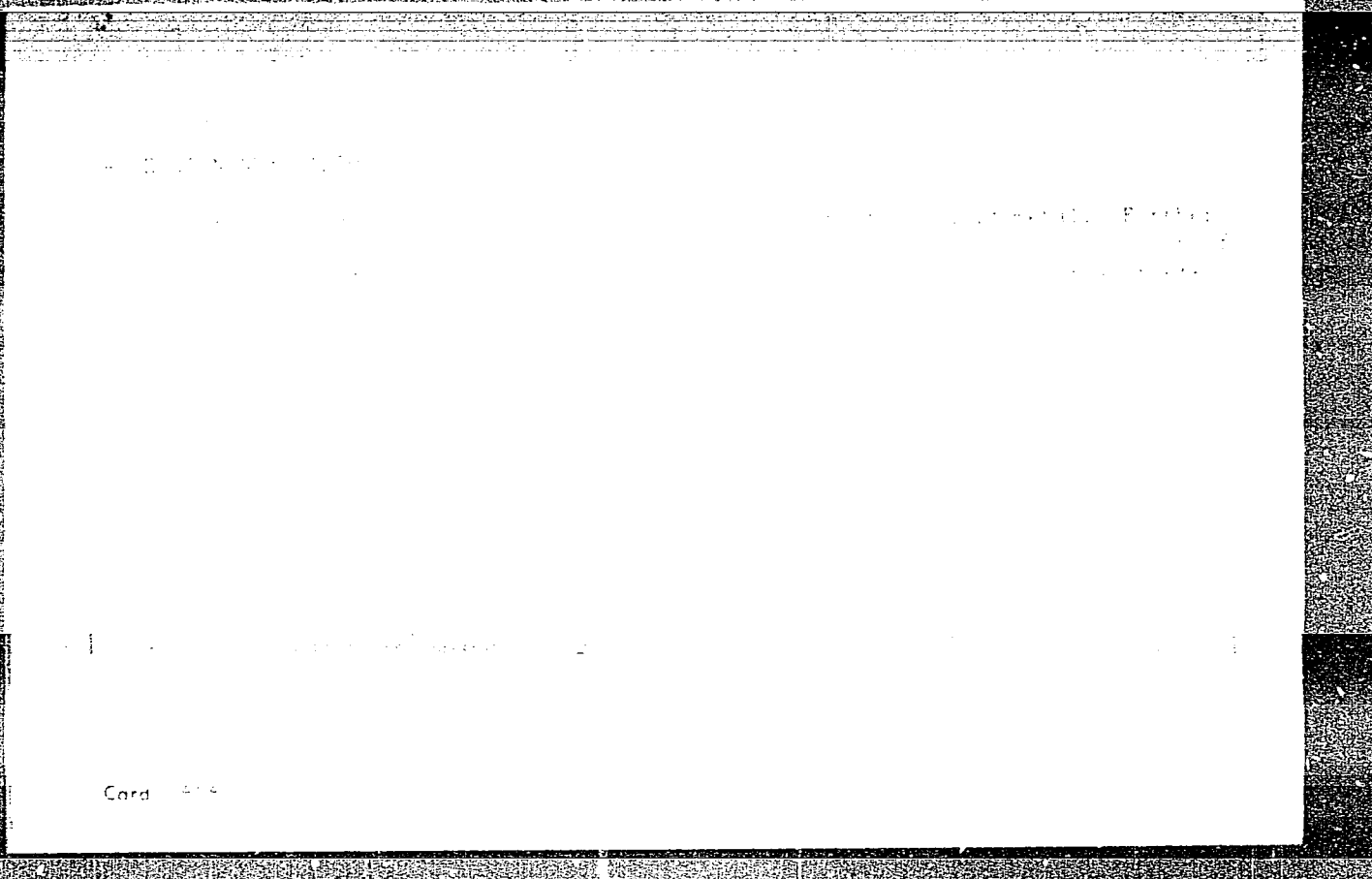
L 15158-66

ACC NR: AP6002029

A current of 1--3 amp was passed through the sample at 300C for 6--8 hours. The potential drop was then measured approximately every hour, using a measuring current of 100 ma. The measurements were carried out in a nitrogen atmosphere at a pressure of 2--3 atmospheres. The successive increase in the resistance of the anode and corresponding decrease in the resistance of the cathode is explained by the motion of the Sb atoms towards the anode. The results were checked by the method of radioactive isotopes, the latter yielding mobilities and effective charges which were higher by 15 per cent. Orig. art. has: 12 formulas, 2 figures, and 2 tables.

SUB CODE: 20/ SUBM DATE: 05Apr65/ ORIG REF: 008/ OTH REF: 001

Card 2/2 vmb



15A(25)-2/IMP(5)

ABSTRACT: Particles of colloidal size were introduced into approximately half the length of metal-filled quartz capillary tubes in an attempt to achieve the conditions of absolute electrical transfer of the metals in liquid state. The existence of absolute electrical transfer of the metals in the tubes.

5-3-12

Card 2/2

L 24453-66 EWT(1)/EWT(m)/ENP(w)/T/ENP(t) IJP(c) JD/GS/AT

ACC NR: AT6010577

(N)

SOURCE CODE: UR/0000/65/000/000/0096/0105

AUTHOR: Kuz'menko, P. P. (Doctor of physico-mathematical sciences); Novikov, N. N.; Gorid'ko, N. Ya.

ORG: Kiev State University im. T. G. Shevchenko (Kiyevskiy gosudarstvennyy universitet)

TITLE: The photomechanical effect in crystals and its physical nature

SOURCE: AN UkrSSR. Mekhanizm plasticheskoy deformatsii metallov (Mechanism of the plastic deformation of metals). Kiev, Naukova dumka, 1965, 96-105

TOPIC TAGS: photoeffect, semiconductor crystal, IR radiation, germanium, cadmium sulfide, antimony, titanium, hardness

ABSTRACT: The authors study the photomechanical effect (a reduction in the hardness of a material under illumination at room temperature) in *n*- and *p*-Ge, dislocationless *n*-Ge, CdS, antimony and titanium. The microhardness of the specimens was measured as a function of illumination intensity. The curves for *n*- and *p*-germanium and dislocationless germanium are all similar. The change in hardness for *p*-germanium is approximately 1/2 that for *n*-germanium. The surface hardness of *n*-

Card 1/2

L 24453-66

ACC NR: AT6010577

germanium decreases with an increase in illumination by approximately 57-60%, while that of p- germanium changes by 40%. The curves show saturation at approximately 20,000 lux. The softened layer extends to a depth of 1-2 μ . The photomechanical effect takes place only in the infrared region of the spectrum where the natural absorption region lies. The surface hardness of cadmium sulfide is reduced by approximately 40% with an increase in illumination intensity. Saturation begins at approximately 40,000 lux. The photomechanical effect in antimony reaches 45% with saturation at 30,000 lux. The depth of the softened layer is approximately 3 μ . Titanium shows an effect of 30% with saturation at 25,000 lux. The depth of the softened layer is 2.6 μ . The effect takes place in the infrared region of the spectrum in all specimens except cadmium sulfide. This is probably due to the fact that acceptor levels of dislocations in CdS lie rather deep with respect to the bottom of the conduction band, as distinct from germanium. A curve for microhardness in n-germanium as a function of current carrier concentration shows that an increase in current carriers reduces microhardness. It is suggested that a study should be made of the magnitude of the photomechanical effect as a function of light frequency. Orig. art. has: 8 figures.

SUB CODE: 20/ SUBM DATE: 23Jul64/ ORIG REF: 005/ OTH REF: 002

Card 2/2 *dda*

L 36922-66 T/EMP(t)/EWT(m) IJP(c) WN/JE/B
 ACC FR: AP6013908 SOURCE CODE: UR/0076/66/040/004/0818/0821

AUTHOR: Kuz'menko, P. P. ; Onopriyenko, G. I. ; Khar'kov, Ye. I.

ORG: Kiev State University im. T. G. Shevchenko (Kiyevskiy gosudarstvennyy universitet)

TITLE: Diffusion of certain admixtures in liquid Bi, Pb, and Sn 57
B

SOURCE: Zhurnal fizicheskoy khimii, v. 40, no. 4, 1966, 818-821

TOPIC TAGS: cadmium, bismuth, tin, liquid metal, metal diffusion

ABSTRACT: In this work the authors study the diffusion of Cd and Sn in liquid Bi; Sn in liquid Pb, and Co in liquid Sn in order to compare experimental results with theoretical conclusions concerning the diffusion of atoms in liquid metals in a broad temperature range. The diffusion coefficients were determined by the capillary method with the use of radioactive isotopes Sd^{115} , Sn^{113} , and Co^{60} . The results of measuring the diffusion coefficients showed that the average dispersion of the measurements was 11%. The temperature dependence of the diffusion coefficients in the systems studied by the authors deviate appreciably from exponential, which is in contrast to the data in the literature and is ascribed to the broader temperature range used by the authors. An interesting fact revealed was the marked difference of the diffusion coefficients of Sn and Sd in liquid Bi, es-

Card 1/2

UDC: 541.11

L 38922-66

ACC NR: AP6013908

pecially at high temperatures, e.g., at 900C the cadmium atoms diffused 5 times more quickly than the tin atoms. This contradicted the assertion made in the literature that the coefficients of diffusion of various admixtures in a given solvent are similar. The authors conclude that for more definite conclusions on the mechanisms of the diffusion of atoms in liquid metals a further accumulation of experimental data is needed. Orig. art. has: 5 tables, 2 figures, and 2 formulas.

SUB CODE: 20,11/ SUBM DATE: 16Sep64/ ORIG REF: 005/ OTH REF: 004

Card

2/2

10

ACC NR: AP6018534

SOURCE CODE: UR/0181/66/008/006/1732/1738

AUTHOR: Kuz'menko, P. P.; Novikov, N. N.; Gorid'ko, N. Ya.; Fedorenko, L. I.

ORG: Kiev State University im. T. G. Shevchenko (Kiyevskiy gosudarstvennyy universitet)

TITLE: Photomechanical effect in germanium doped with weakly soluble elements

SOURCE: Fizika tverdogo tela, v. 8, no. 6, 1966, 1732-1738

TOPIC TAGS: germanium, hardening, photomechanical effect

ABSTRACT: The purpose of the investigation was to clarify the physical nature of the decrease in hardness of illuminated Ge, in view of the lack of information on the influence of impurities on this process and the lack of systematic research on the influence of impurities on the hardness of Ge, in general. Tests were made on samples containing small concentrations of Sb, In, and Ga, and also on Sb containing Ge as an impurity. The Ge host in all tests was standard single crystal with carrier density not higher than $5 \times 10^{13} \text{ cm}^{-3}$. The photochemical effect was measured with the PMT-3 instrument using a procedure described elsewhere (Izv. Vuzov. Fizika, No. 4, 22, 1964). In all cases it was found that the decrease in the hardness of the illuminated surface was strongly dependent on the amount of impurity. When the impurity concentration reached the solubility limit, the photomechanical effect decreased to zero. The character of the impurity had no influence, within the limits of errors, on either the characteristics of the photomechanical effect or the microhardness of the samples in darkness. It is therefore concluded that the governing factor in the

Card 1/2

L 41567-66

ACC NR: AP6018534

properties of Ge is the quantity and not the type of impurity. In view of the complicated nature of the phenomenon, however, the authors caution that the results should be regarded only as preliminary. Orig. art. has: 8 figures and 2 tables.

SUB CODE: 20/ SUBM DATE: 01Nov65/ ORIG REF: 011/ OTH REF: 004

Card

2/2mLP

83333

S/117/60/000/008/009/020

A002/A001

1.2300 ^{out to}
2408

AUTHORS: Us, N.P., Kuz'menko, P.Ye., Us, A.N.

TITLE: Combined Electric Welding of Aluminum Alloy Parts

PERIODICAL: Mashinostroitel', 1960, No. 8, p. 17

TEXT: The authors distinguish the following methods of welding aluminum alloy parts: a) the flux is applied directly to the welding rod and the place of welding (method of P.N. Benardos); b) the coating is applied to the electrode rod (method of N.G. Slavyanov); c) the coating is applied to the electrode rod and the welding is performed with a graphite electrode (combined method). At the Khar'kov "Serp i molot" Plant the combined method was introduced for restoring parts cast of AL-9 (AL-9) and AL-10 (AL-10) aluminum alloys because the first two methods have certain deficiencies. The introduction of the combined welding method reduced the cost of producing the CMII (SMD) diesel engine and eliminated rejects in casting and mechanical processing. The graphite electrodes are 200-300 mm long and 12-18 mm in diameter, depending on the thickness of the metal to be welded. Welding is performed with 250-350 amps. d.c. of reversed polarity. The aluminum welding rods contain 0.90% copper, 1.81% iron and 6.4% silicon and

111

Card 1/2

83333

S/117/60/000/008/009/020
A002/A001

Combined Electric Welding of Aluminum Alloy Parts

have diameters of 8-12 mm at 4-16 mm thickness of parts to be welded. The coating applied to the welding rods consists of 15% sodium chloride, 50% potassium chloride and 35% cryolite. For each 100 weight parts of the dry compound, 25-30 cm³ water are added. The coating is applied with a brush to the welding rods, dried, and heated at 140-150°C for 30 minutes. Investigations of welds performed with this coating showed the monolithic structure, compactness and strength of the seam. There is 1 figure. ✓

Card 2/2

HUZ'MENKO, S.D., Cand Agr Sci -- (diss) "Comparative study of
the economic and biological properties of *simmentalized*,
black-spotted, and Ukrainian *white-head* cattle raised *under* identical
natural *farm* conditions." Kiev, 1959, 22 pp (Min of Agr UkSSR.
Ukrainian Acad Agr Sci) 150 copies (KL, 36-59, 117)

- 67 -

KUZ'MENKO, S.F., inzh.; VISHNIVETSKIY, M.G.

Planetary transmissions of high capacity. Energomashinostroenie
8 no.5:34-35 My '62. (MIRA 15:5)
(Hydraulic turbines--Transmission devices)

100-240-100101

PROCESSING AND PROPERTY NOTES

CH

2

Origin and growth of new phases in connection with the mutual effect of various properties of substances and external factors. I. Reactivity of various portions of crystals. Studies in the field of topochemical and topophysical transformations. S. S. Urazovskii *J. Phys. Chem.* (U. S. S. R.) 6, 883-885 (1935).—The reactions $\text{Na}_2\text{S}_2\text{O}_8 + \text{I}_2$, $\text{AgNO}_3 + \text{I}_2$, $\text{BaCl}_2 + \text{H}_2\text{SO}_4$, $\text{NaCl} + \text{Cu}(\text{OAc})_2$ in nonsol. media, $\text{CaCO}_3 + \text{HCl}$, and the dehydration of $\text{Na}_2\text{S}_2\text{O}_8 \cdot 5\text{H}_2\text{O}$ and of $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ are discussed on the basis of U.'s microscopic studies. Various parts of the crystals have varying reactivities. II. Effect of the medium and impurities on the origin and growth of a disperse phase in aerosols. S. S. Urazovskii and S. N. Kuz'menko. *Ibid.* 806-910.—Dispersity and stability were studied microscopically, ultramicroscopically, photometrically and by sedimentation. Increasing mol. wt. of the dispersing medium and surface-active admixts. stabilize aerosols. As media various alcs., phenols, benzene and ethers were used. III. Effect of the place of deposition on the structure of metallic films. S. S. Urazovskii and N. A. Yakimkin. *Ibid.* 911-23.—in very thin Ni films, migration of atoms of Ni occurs. They also absorb water vapors. Forty photomicrographs of various substances are shown. F. H. Rathmann

434 31A METALLURGICAL LITERATURE CLASSIFICATION

A. E. S.

Ecology

Effect of salt solutions on the stability of suspensions
of Chagov-Yar clay No. 5 and Palansk kaolin. S. N.
Kus'menko. *Bull. Khim. Obshchestva Mendeleeva*, 1940,
No. 11, pp. 11-12; *Khim. Referat. Zhur.*, 4 [7-8] 94
(1941). M.Ho.

KUZ'MENKO, S. N.

USSR/Engineering
Clays
Oil Reclamation

Feb 1948

"Use of Khar'kov 'Elenka' Clay for the Reclaiming Industrial Oils," Ts. O. Gekhtman,
Engr; Docent S. N. Kuz'menko, $\frac{1}{2}$ p

"Elek Stants" No 2

Describes tests conducted at Khar'Kov city power station on subject clay. Compares results obtained from use of 'Elenka' and those obtained from use of 'Gumbril,' which is usually used as reclaiming material.

PA 61T39

ca

2

Nikolai Nikolaevich Beketov and his place in the history
of physical chemistry. S. N. Kaz'menko. *Uspekhi*
Khim. 17, 133-43(1948).—Biographical sketch with por-
trait.
G. M. Kosolapoff

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

FROM SYMBLAW → TO LETTERS

← FROM ADVANCE TO LETTERS

SOURCE # 10 9 8 7 6 5 4 3 2 1 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

TO LETTERS 10 9 8 7 6 5 4 3 2 1 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

KUZ'MENKO, S. N.

Kuz'menko, S. N. - "Some data on the history of the development of chemistry in Khar'kov", Soobshch. o nauch. rabotakh chlenov Vsesoyuz. khim. o-va im. Mendeleyeva, 1949, Issue 1, p. 34-35.

SO: U-4630, 16 Sept. 53, (Letopis 'Zhurnal 'nykh Statey, No. 23, 1949).

KUZMENKO, S N

Experimental properties of Khar'kov clay
M. Kuzmenko (Aviation Inst. 1962) 1962
Chem. U.S.S.R. 25: 543-57 (1962) (English translation)
Zhur. Priklad. Khim. 25: 485-486 (1962) — An investigation of
the chief raw material for brick production in the Khar'kov
area with a view to using the clay as a sorbent. Tests
in the lab. and on an industrial scale showed it to be suitable
as a sorbent for practical purposes. A. J. Cohen

"APPROVED FOR RELEASE: Monday, July 31, 2000

CIA-RDP86-00513R000928020

KUZ'MENKO, S.N.

APPROVED FOR RELEASE: Monday, July 31, 2000

CIA-RDP86-00513R000928020C

KUZ'MENKO, S. N.

KUZ' MENKO, S. N.

KUZ' MENKO, S. N.

The Russian physicochemist Pavel Dmitrievich Khrushchev. Soob.o
nauch.rab.chl.VKHO no.3:42-44 '54. (MIRA 10:10)
(Khrushchev, Pavel Dmitrievich, 1849-1909)

KUZ'MENKO, S.N.

On the book of F.D.Ovcharenko "Development by colloid chemistry
in the Ukrainian S.S.R." Reviewed by S.N.Kuz'menko. Koll.shur.
18 no.1:126-128 Ja-F '56. (MIRA 9-6)
(Ukraine--Colloids) (Ovcharenko, F.D.)

AUTHORS: Kuz'menko, S.N., Kurilenko, L.Ya. SOV/10-32-2-5/56

TITLE: Sorption Properties of Romny and Revovskaya Clays of the UkrSSR
(Sorbtsionnyye svoystva romenskoj i revovskoj glin UkrSSR)

PERIODICAL: Zhurnal prikladnoy khimii, 1959, Vol XXXII, Nr 2;
pp 268-272 (USSR)

ABSTRACT: Romny and Revovskaya clays were compared with clays of the gumbrin and tripoli-earth type as to their sorption properties, especially in the regeneration of used transformer and aviation oil. The chemical and mechanical analysis of the clays is given in Tables 1 and 2. The sorption of the vapors of the aromatic hydrocarbons C_6H_6 , $C_6H_5CH_3$, and $C_6H_4(CH_3)_2$ was determined by the static exsiccator method. It has been shown that the sorption properties of the Romny and Revovskaya clays for these vapors are below those of gumbrin, tripoli-earth, etc. The sorption of aqueous solutions of organic dyes, like malachite green, methylene blue, and basic fuchsin was also investigated. Revovskaya clay showed good sorption properties for these dyes which were even higher than in gumbrin. For the regeneration of oils the clays were ground and passed a sieve of 1,600 openings per cm^2 . Then they were dried for one hour at 110-120°C. The contacting lasted 1 hour

Card 1/2

SOV/80-32-2-5/56

Sorption of Properties of Romny *Revovskaya* Clays of the USSR

at a temperature of 80°C followed by settling during 1 day and filtering. The color of the oil changes during the treatment. The used transformer and aviation oils after regeneration corresponded to the specifications of the State Standard GOST.

There are 6 tables and 10 Soviet references.

SUBMITTED: June 21, 1957

Card 2/2

KUZMENKO, Stepan Yegorovich; TOROPOV, A., red.; TROYANOVSKAYA, N., tekhn.
red.

[Master of welding] Master ognennogo dela. Moskva, Gospolitizdat,
1962. 31 p. (MIRA 15:6)

1. Zhurnalist gazety "Pravda" (for Kuzmenko).
(Ulesov, Aleksei Aleksandrovich)

KUZ'MENKO, V., inzh.

Measuring the torque on ship power plant shafts by the phase-shift
method. Rech. transp. 20 no.5:53-54 My '61. (MIRA 14:5)
(Torque—Measurement) (Marine engineering)

KRYLOV, A.P. (Kiyev); KUZ'MENKO, V.A. (Kiyev); VETROV, I.Ye., inzh. (Kiyev)

Larger volume of transportation with a smaller expenditure of fuel; from the experience of the Southwestern Railroad. Zhel. dor. transp. 45 no.3:70-72 Mr '63. (MIRA 16:6)

1. Nachal'nik sluzhby lokomotivnogo khozyaystva Yugo-Zapadnoy zheleznoy dorogi (for Krylov).
2. Nachal'nik lokomotivnogo depo Darnitsa Yugo-Zapadnoy zheleznoy dorogi (for Kuz'menko).
3. Lokomotivnoye depo Darnitsa Yugo-Zapadnoy zheleznoy dorogi (for Vetrov).

(Railroads Management)
(Diesel locomotives)

GUS'KOV, V.V., kand. tekhn. nauk; KUZ'MENKO, V.A., inzh.;
BADALOV, M.M., inzh.

Selecting optimal parameters for wheeled tractors. Trakt.
i sel'khoz mash. 33 no.10:1-4 O '63. (MIRA 17:1)

1. Tsentral'nyy nauchno-issledovatel'skiy institut
mekhanizatsii i elektrifikatsii sel'skogo khozyaystva
nechernozemnoy zony SSSR.

"APPROVED FOR RELEASE: Monday, July 31, 2000

CIA-RDP86-00513R000928020

APPROVED FOR RELEASE: Monday, July 31, 2000

CIA-RDP86-00513R000928020C

AUTHOR: Kuz'menko, V.A.

SOV-21-58-9-3/28

TITLE: Arrangement for Testing the Endurance of Materials at High-Frequency Loading (Ustanovka dlya ispytaniya materialov na vyнослиvost' pri vysokochastotnom nagruzhении)

PERIODICAL: Dopovidi Akademii nauk Ukrain's'koi RSR, 1958, Nr 9, pp 946 - 950 (USSR)

ABSTRACT: An arrangement for testing the endurance of materials for symmetrical variations of tension alternating with compression was employed. The vibration frequency was 20,000 cycles per second. The principle of its operation consists in the inducement of longitudinal vibrations of the specimen in its resonance frequency by means of a magnetostriction vibrator with a double core. The arrangement was equipped with an electronic device which permits making the tests both with independent control of vibration frequency and with self-vibrations. Tests were performed with steel and metalloceramic specimens, and the results of the steel tests are presented in the graphically formed fatigue curves. There are

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SOV-21-58-9-8/28

Arrangement for Testing the Endurance of Materials at High-Frequency Loading

2 photos, 1 block-diagram, 1 graph and 6 references, 1 of which is Soviet, 1 American, 2 English and 2 French.

ASSOCIATION: Institut metallokeramiki i spetsial'nykh splavov AN UkrSSR
(Institute of Metalloceramics and Special Alloys of the AS UkrSSR)

PRESENTED: By Member of the AS UkrSSR, S.V. Serensen

SUBMITTED: March 28, 1958

NOTE: Russian title and Russian names of individuals and institutions appearing in this article have been used in the transliteration.

1. Materials--Mechanical properties
2. Materials--Test methods
3. Mathematics

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7(1) 15(6)

SOV/32-24-11-27/37

AUTHOR:

Kuz'menko, V. A.

TITLE:

Determination of Elasticity Constants of Materials by Means of Longitudinal Ultrasonic Oscillations
(Opredeleniye uprugikh postoyannykh materialov pri pomoshchi prodol'nykh ul'trazvukovykh kolebaniy)

PERIODICAL:

Zavodskaya Laboratoriya, 1958, Vol 24, Nr 11, pp 1407-1408
(USSR)

ABSTRACT:

The elasticity moduls E and G as well as the Poisson coefficient μ were determined according to known equations. The frequency of the longitudinal oscillations in the test bar were measured in a special piezo-electric device (Ref 1). The speed C_1 was determined by means of an ultrasonic caliper of the V4-8R type. An analysis of the error in the determination of the values of μ and G is very important, as the speed C_1 and C_2 hardly differ from each other. It is pointed out that the relative error of determination of the elasticity constants μ and G increases when the value of μ is reduced. The measuring and calculating results for test bars of carboniferous steel are given which were obtained according

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Determination of Elasticity Constants of Materials
by Means of Longitudinal Ultrasonic Oscillations

SOV/32-24-11-27/37

to the method described. The results show that this method of determining the elasticity constant can also be applied to other cast materials as their Poisson coefficient, for the larger part of them, does not exceed the value of 0,28. Furthermore, also metalloceramic materials (chromium carbide, tungsten carbide, zirconium boride, etc.) can be determined. There are 1 figure, 1 table, and 2 Soviet references.

ASSOCIATION: Institut metallokeramiki i spetsial'nykh splavov Akademii nauk USSR
(Institute of Powder Metallurgy and Special Alloys of the Academy of Sciences, UkrSSR)

Card 2/2

KUZMENKO, V. A.

PHASE I BOOK EXPLOITATION SOV, 3623

Akademika nauk Ukrainy SSR. Institut metallorazvedki i spetsial'-
nykh splavov

Metallorazvedcheskiye materialy i metody ikh issledovaniya: infor-
matsionnyye materialy (Soviet Materials and Methods of their
Analysis; Information Material) Kiev, Izd-vo AN UkrSSR, 1959.
35 p. 1,500 copies printed.

Ed. of Publishing House: I. V. Kistina; Tech. Ed.: A. M. Lisovets
Editorial Board: I. M. Krasovskiy, I. M. Fedorchenko, G. S.
Pisarenko, G. V. Samsonov (Resp. Ed.), V. M. Yermolenko, and V. M.
Federnko.

PURPOSE: This collection of articles is intended for scientific
workers, designers, and engineering and technical workers in
the metallurgical, machinery-manufacturing and other branches
of industry.

COVERAGE: In this collection of articles the authors describe the
production of castable nitrides and other heat resisting con-
pounds having their physical, chemical, and mechanical properties.
Their thermal processing and the processes of installation are
also described. A new method is proposed for the production of
rods from refractory compounds. Castable compounds are analyzed,
and the energy dissipation in materials during high frequency
mechanical vibrations is determined. No particular attention is
given to the energy dissipation in materials during high frequency
vibrations. There are 7 schematic drawings, 7 diagrams, 6 tables
and 17 references, 16 of which are Soviet.

Fedorchenko, I. M., and Yu. B. Yermolovich. Installation for Determi-
ning the Kinetics of Evaporation and the Vapor Tension of Metal Evapora-
tors. 17

Rus. Iankov, V. A. Method of Determining the Real Characteristics
of Energy Dissipation in Materials During Vibrations 17

Yermolenko, V. M., and T. Ya. Vailanovna. Installation for Heat Treat-
ment of Specimens at High Temperature 22

Yermolenko, V. M., and T. Ya. Vailanovna. Conditions for Preparing
Alloys of Titanium Carbide With Polysilanes 25

Klibov, A. M. Determination of Small Quantities of Nitrogen in
Titanium Carbide 27

Ostrenko, A. P. Device for Measuring the Thermoelectromotive
Force of Semiconductor Materials at Room Temperature 30

Kozlov, L. A. Utilization of Jaeger Coatings to Investigate the
Limiting State of Discs 32

Samsonov, G. V. Physicochemical and Mechanical Properties of the
Carbides and Nitrides of Boron and Silicon 36

Kuzmenko, V. A. Calorimetric Method of Determining Energy Dissipa-
tion in a Material During High-Frequency Mechanical Vibrations 40

Verkhoglyadova, T. S. Preparation of Titanium Nitride From Titanium
Sponges 45

Verkhoglyadova, T. S., and O. G. Seraya. Analysis of Vanadium Silicide
46

Pan'kovskiy, V. V., and G. V. Samsonov. New Method of Preparing
Bars from High-Melting Compounds 50

Samsonov, G. V., T. S. Verkhoglyadova, M. M. Antonov, and T. V.
Dubovik. Preparation of the Nitrides of High-Melting Metals 53

KUZ'MENKO, V. A. Cand Tech Sci -- (diss) "Study of the characteristics of strength by means of mechanical high-frequency vibrations." Kiev, 1959
10 pp with graphs (Acad Sci UkrSSR. Inst of Construction Mechanics), 110 copies (KL, 46-59, 137)

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24(6)

SOV/170-59-6-6/20

AUTHOR: Kuz'menko, V.A.

TITLE: Steel Fatigue in High Frequency Loading

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, 1959, Nr 6, pp 41-46 (USSR)

ABSTRACT: This investigation was undertaken in order to study the strength of materials in loading specimens at a frequency of 20 kc. Fatigue tests at such a high frequency make it possible to reduce sharply duration of experiments, which is of practical and scientific interest. The block diagram of an installation employed for these tests is shown in Figure 1 and the manner of its operation is described in detail. The excitation of oscillations is induced by a magnetostriction vibrator fed by alternating current of the 20 kc frequency. Stresses in the critical section of a specimen tested are determined by measuring the amplitude of vibrations of its butt with the aid of a 800-fold magnification microscope; the accuracy of amplitude measurement amounts to 2%. Carbon steel specimens of two shapes, shown in Figure 2, were tested. The fatigue curves plotted according to the results of tests are shown in Figure 3. The fatigue limit

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25(2)

SOV/32-25-3-36/62

AUTHOR:

Kuz'menko, V. A.

TITLE:

Apparatus to Determine the Young Modulus at High Temperatures
(Ustanovka dlya opredeleniya modulya Yunga pri vysokikh
temperaturakh)

PERIODICAL:

Zavodskaya Laboratoriya, 1959, Vol 25, Nr 3, pp 351-353 (USSR)

ABSTRACT:

In the apparatus described the dynamic method is applied to the determination of the Young modulus E. The Young modulus is determined in measuring the frequency of longitudinal oscillations f in the case of rod samples at different temperatures according to the equation

$E = 4qf^2 l^2 \Delta^2$ (q = density of the sample, l = length of the rod sample, Δ = correction according to Reley). The sample is vertically (Fig 1) put into an electric oven and on the lower end connected with the vibrator, whereas from the upper end the oscillations of the sample are transmitted to a piezoelectric element (barium titanate foil) over a light ceramic rod. The voltage of the element is transmitted to an oscilloscope by means of an amplifier. The vibrator is fed by a generator ZG-12.

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SOV/32-25-3-36/62

Apparatus to Determine the Young Modulus at High Temperatures

The temperature in the oven is measured by thermocouples with a direct-current potentiometer PP. Diagrams obtained in connection with testing the steel 2Kh13 (Cr = 13.08%, C = 0.26%) are given (Fig 2). Measurements of the eigenfrequency of the longitudinal oscillations of samples at normal temperature were carried out by a special piezoelectric apparatus (Ref 2) with an accuracy of 0.05%. For the determination of the frequency a quartz-heterodyne of the 528-type was used. There are 2 figures and 2 Soviet references.

ASSOCIATION: Institut metallokeramiki i spetsial'nykh splavov Akademii nauk Ukrainskoy SSR (Institute of Metalloceramics and Special Alloys of the Academy of Sciences, UkrSSR)

Card 2/2

28(5)
AUTHOR:

Kuz'menko, V. A.

SOV/32-25-9-31/53

TITLE:

On the Dynamic Method for Determination of Young's Modulus at High Temperatures

PERIODICAL:

Zavodskaya laboratoriya, 1959, Vol 25, Nr 9, pp 1107 - 1108 (USSR)

ABSTRACT:

The author investigated the influence exerted by uneven temperature distribution on the amount of Young's modulus in a rod-shaped sample, using the dynamic method of determination. Tests were made on special installation described in reference 1, longitudinal oscillations of the sample occurring. Tests were made on two samples 8 mm thick and 110 mm long, which were turned down from the same rod of fireproof steel EI612. Measurements on the one sample were made under even heating (H) and on the second sample under uneven heating (H). The resulting diagrams (Fig) show that though the (H) of the 2nd sample was fairly uneven, there was no great difference noticeable in the two diagrams. The error in the determination of Young's modulus rises with temperature, and only at 950° it attains a noticeable value (+ 8%), so that even temperature

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On the Dynamic Method for Determination of Young's Modulus SOV/32-25-9-31/53
at High Temperatures

distribution along the sample becomes necessary only with specially precise measurements. A method of calculating Young's modulus, with regard to uneven heating of the sample (sample center hotter than sample ends), is then given. The proposed method of calculation allows for the use of simpler constructed test arrangements since the sample ends need not be heated and Young's modulus nevertheless can be determined at high temperatures. There are 1 figure and 1 Soviet reference.

ASSOCIATION: Institut metallokeramiki i spetsial'nykh splavov Akademii nauk USSR (Institute for Metal Ceramics and Special Alloys of the Academy of Sciences of the UkrSSR)

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КАЧЕСТВЕНАЯ КОПИЯ

PHASE I BOOK EXPLOITATION 307/5303

Nauchno-tekhnicheskoye soveshchaniye po dempfirovaniyu kolebaniy. Kiyev, 1958.

Trudy Nauchno-tekhnicheskogo soveshchaniya po dempfirovaniyu kolebaniy, 17 - 19 dekabrya 1958 g. (Transactions of the Scientific and Technical Conference on the Damping of Vibrations, Held 17 - 19 December, 1958) Kiyev, Izd-vo AN UkrSSR, 1960. 178 p. 2,000 copies printed.

Sponsoring Agency: Akademiya nauk Ukrainskoy SSR. Institut metallokoramki i spetsial'nykh splavov.

Editorial Board: I. M. Prutselich, G. S. Pisarenko (Resp. Ed.), G. V. Samonov, V. V. Grigorieva, and A. P. Yakovlev; Ed. of Publishing House: I. V. Kisina; Tech. Ed.: A. A. Matveychuk.

COVERAGE: The book contains 27 articles dealing with principal results of theoretical and experimental investigations of energy dissipation in mechanical vibrations carried out in the Soviet Union from 1956 to 1958. Problems of energy dissipation in materials and factors affecting it are discussed. Purportedly new methods of experimental investigation of damping of vibrations are presented. Attention is given to the recently developed nonlinear theory of calculating vibrations in elastic systems, taking energy dissipation into account. Attempts to analyze internal energy dissipation in materials using methods of mathematical statistics are discussed. Some articles deal with engineering problems in dynamics, in which damping is claimed to play a highly substantial part. Aspirant N. Z. Mucha, of the Kiev Polytechnic Institute, is mentioned. References accompany some of the articles.

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Timoshenko, V. G. [Candidate of Technical Sciences]. On Some Experimental Methods for Studying Energy Dissipation in Vibrating Material	84
Mitkevich, Z. A. A New Method for Determining Characteristics of Internal Friction	93
Kuz'menko, V. A., [Junior Scientific Worker]. Calorimetric Study Method for Energy Dissipation in a Material Subjected to High-Frequency Mechanical Vibrations	97
Khil'chevskiy, V. V., [Candidate of Technical Sciences]. On the Determination of the Logarithmic Decrement of Freely Damped Vibrations	99
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Morikov, N. V., [Candidate of Technical Sciences]. Effect of the Type of State of Stress on Energy Dissipation in a Vibrating Material	107
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Yakovlev, A. P., [Candidate of Technical Sciences]. On Energy Dissipation in Rods Subjected to Bending Vibrations of Different Types	118
Mukhin, N. M. On the Effect of Geometric Dimensions of Specimens on Energy Dissipation in a Material Vibrating Torsionally	123
Yakovlev, A. P., and N. G. Zhumilova [Senior Engineer. Institut metallokoramki i spetsial'nykh splavov AN UkrSSR (Institute of Powder Metallurgy and Special Alloys, Academy of Sciences UkrSSR)]. Study of the Effect of the Dimensions of Cement Specimens on Logarithmic Decrement of Damping Transversal Vibrations	127

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28000
S/194/61/000/004/046/052
D266/D302

AUTHOR: Kuz'menko, V.A.

TITLE: Determining the elastic constants of materials with the aid of longitudinal ultrasonic waves

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 4, 1961, 16, abstract 4 E125 (V sb. Primeneniye ul'trazvukovykh kolebaniy dlya issled. svoystv. kontrolya kachestva i obrabotki metallov i splavov, Kiev, AN USSR, 1960, 68-73)

TEXT: A method is described for determining the elastic moduli E and G and that of Poisson's ratio μ at normal and high temperatures (up to 1200°C) employing rod samples. Mathematical formulae are derived, the errors of the measurements are indicated and results are given for steels and some heat resistant alloys. [Abstracter's note: Complete translation]

Card 1/1

-KUZ'MENKO, V.A.

PHASE I BOOK EXPLOITATION

SOV/6342

Pisarenko, Georgiy Stepanovich, Valeriy Trofimovich Troshchenko, Vsevolod Georgiyevich Timoshenko, Vasiliy Aleksandrovich Kuz'menko, Georgiy Vakhtangovich Isakhanov, Georgiy Nikolayevich Tret'yachenko, Boris Alekseyevich Gryaznov, Nikolay Vasil'yevich Novikov, Vasiliy Nikitich Rudenko, and Rufina Gerasimovna Shumilova

Prochnost' metallokeramicheskikh materialov i splavov pri normal'nykh i vysokikh temperaturakh (Strength of Sintered Materials and Alloys at Room and High Temperatures) Kiyev, Izd-vo Akademii nauk UkrSSR, 1962. 274 p. Errata slip inserted. 2400 copies printed.

Sponsoring Agency: Akademiya nauk Ukrainskoy SSR. Institut metallokeramiki i spetsial'nykh splavov.

Resp. Ed.: G. S. Pisarenko, Corresponding Member, Academy of Sciences USSR; Ed.: I. V. Lebedev; Tech. Ed.: Yu. B. Dakhno.

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1/2

Strength of Sintered Materials (Cont.)

SOV/6342

PURPOSE: The book is intended for engineers, scientific research workers, aspirants, and students concerned with problems of the strength of sintered materials and structural parts.

COVERAGE: The book reviews the results of studying the strength, ductility, and elasticity of materials and structural parts produced by powder-metallurgy methods and presents brief information on these methods. Particular attention is given to methods of experimental investigation of physical and mechanical characteristics of heat-resistant sintered materials with specific properties, and to the description of a number of testing units developed for these investigations. Some problems of the theory of the strength of brittle sintered materials and high-porosity ductile materials are discussed. Laws governing changes in characteristics of strength and elasticity under the effect of various factors are outlined. The appendix includes reference tables with data on the basic mechanical characteristics of a number of sintered materials. The assistance of members of the Powder Metallurgy Institute V. I. Kovpak, Yu. A. Kashtalyan, L. V. Kravchuk, A. P. Yakovlev, V. K. Kharchenko, V. K. Kuz'menko, and V. A. Chebotarev is acknowledged. There are 141 references, mostly Soviet.

Card 2/2 2

KUZ'MENKO, V.A. [Kuz'menko, V.O.] (Kiyev)

Effect of shear and inertia of rotation on lateral vibrations
of rods. Prykl.mekh. 8 no.4:389-393 '62. (MIRA 15:9)

1. Institut metallokeramiki i spetsial'nyk splavov AN USSR.
(Elastic rods and wires--Vibrat'on)

KUZ'MENKO, V. A. [Kuz'menko, V. O.]

Activity of the seminar on mechanics at the Department of Technical Sciences of the Academy of Sciences of the Ukrainian S.S.R. at the end of 1961 and in the first half of 1962. Prykl. mekh. 8 no.6:684-686 '62. (MIRA 15:10)

(Academy of Sciences of the Ukrainian S.S.R.)

S/032/62/028/006/019/025
B108/B104

AUTHOR: Kuz'menko, V. A.

TITLE: Determination of the Young modulus by dynamic methods

PERIODICAL: Zavodskaya laboratoriya, v. 28, no. 6, 1962, 726-729

TEXT: The Young modulus of various specimens was measured from the natural frequencies of their longitudinal and transverse oscillations. The error in calculating the Young modulus by various approximation formulas is demonstrated to depend on the length-to-thickness ratio of the specimen. This error is significant if the Young modulus is determined on short specimens. The error can be reduced by choosing slender objects and taking into account the rotational inertia and displacement of the specimen's elements in the bending oscillations. There are 1 figure and 1 table.

ASSOCIATION: Institut metallokeramiki i spetsial'nykh splavov Akademii nauk USSR (Institute of Powder Metallurgy and Special Alloys of the Academy of Sciences UkrSSR)

Card 1/1

ACCESSION NR AM1020385

BOOK EXPLOITATION

S/

Kuz'menko, Vasilii Aleksandrovich

Sonic and ultrasonic oscillations in dynamic testing of materials (Zvukovy*ye i ul'trazvukovy*ye kolebaniya pri dinamicheskikh ispy*taniyakh materialov), Kiev, Izd-vo AN SSSR, 1963, 150 p. illus., biblio. 2,600 copies printed. (At head of title: Akademiya nauk Ukrainskoy SSR. Institut metallokeramiki i spetsial'ny*kh splavov).

TOPIC TAGS: sonic testing, ultrasonic testing, elasticity, fatigue

PURPOSE AND COVERAGE: The book gives some methods of using sonic and ultrasonic oscillations to study the characteristics of elasticity, inelasticity, and fatigue; besides a classification and description of the experimental methodologies, the design features of various testing equipment used to study the above properties of materials are examined. New data on the mechanical properties of metals and some useful information on sonic and ultrasonic techniques are also given. The book is intended for research and engineering workers in the field of dynamic testing of the strength of materials.

TABLE OF CONTENTS [abridged]:

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ACCESSION NR: AT4033999

S/0000/63/000/000/0145/0146

AUTHOR: Sukhorukov, B. I.; Kuz'menko, V. A.; Blyumenfel'd, L. A.

TITLE: Polycondensation of saccharides and formation of conjugated systems in the solid phase. I. Detection of paramagnetism in protonized saccharides

SOURCE: Geterotsepnny*ye vy*sokomolekulyarny*ye soyedineniya (Heterochain macromolecular compounds); sbornik statey. Moscow, Izd-vo "Nauka," 1963, 145-146

TOPIC TAGS: polycondensation, saccharide, conjugated system, conjugated bond polymer, paramagnetism, protonized saccharide, electron paramagnetic resonance

ABSTRACT: The study is an extension of the authors' previous work in which riboside polycrystals were found to produce, at sufficiently low pH and temperatures, an electron paramagnetic resonance signal linked to the carbohydrate component of the system. The polycondensation of ribosides and saccharides carried out by the action of HCl in the solid phase, resulted in conjugated-bond polymers, not identified immediately, which produced an electron paramagnetic resonance signal in the form of a narrow symmetrical line with a free electron g-factor, a width of 6-8 oersteds between the points of the

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ACCESSION NR: AT4033999

maximum decline and an intensity of $\sim 10^{19}$ spin/g substance. The preparation of solid phase polycrystalline samples is described in detail and the supposition is made that the signal is caused by local paramagnetic centers of a radical or ion-radical nature.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics, AN SSSR)

SUBMITTED: 27Sep62

DATE ACQ: 30Apr64

ENCL: 00

SUB CODE: OC

NO REF SOV: 008

OTHER: 000

Card 2/2

KUZ'MENKO, V.A. [Kuz'menko, V.O.]

Relaxation theory of energy scattering in materials during
cyclic deformations. Dop. AN URSSR no.6:773-777'63

(MIRA 17:7)

1. Institut metallokeramiki i spetsial'nykh splavov AN UkrSSR.
Predstavleno akademikom AN UkrSSR I.N. Frantsevichem [Frntsevykh, I.M.].